

Atmospheric conditions during solar radiation measurements, Blue Hill Observatory of Harvard University

Date and time from apparent noon	Air temperature	Wind (Beaufort Scale)	Visibility (scale 0-10)	Sky blueness	Cloudiness and remarks
<i>February 1935</i>					
1; 2:21 a. m.	-14.1	W 2	8	6	2 Ci.
1; 1:27 p. m.	-6.1	WSW 3	9	7	1 Ci.
1; 2:38 p. m.	-4.4	SWxS 3	8-9	11	Few Ci, Cist, light haze.
1; 4:01 p. m.	-4.7	SW 4	8	6	1 Ci, few Cu.
6; 2:46 a. m.	-17.2	N 5	7-9	9	Few Frcu, heavy haze; inversion.
6; 1:24 p. m.	-8.9	NNW 2	6-7	9	Few Frcu, heavy smoke.
6; 2:58 p. m.	-7.8	NNW 3	6-7	10	No clouds, heavy smoke.
7; 2:48 a. m.	-9.9	NWxW 3	8-9	12	Few Cist; inversion.
7; 1:02 a. m.	-6.7	NNW 2	8-9	8	Few Cist; inversion.
7; 0:03 a. m.	-5.6	NNW 2	8-9	8	Few Cist; inversion.
7; 1:47 p. m.	-3.2	SW 3	8	12	No clouds, light haze.
7; 3:55 p. m.	-1.7	SW 3	8	10	Few Ci.
11; 0:13 a. m.	+10.0	WNW 5	8-9	7	5 Cu.
12; 2:59 a. m.	-15.6	NNW 3	8-9	10	1 Ci, Cuc.
13; 3:10 a. m.	-5.6	N 4	6	9	3 Steu, heavy haze over sun.
13; 0:00 m.	-2.8	NE 3	7	7	1 Acu, 1 Cu, haze.
13; 1:41 p. m.	-2.2	NE 3	7	9	Fumulus, few Cu, heavy haze.
15; 1:12 a. m.	-2.8	WxS 3	8	10	1 Cist, few Cum, moderate haze.
18; 2:41 a. m.	-6.7	WSW 4	7-8	11	1 Ci, Cist, 2 Acu.
18; 3:31 p. m.	+0.3	SSW 5	8	4	Few Acu, haze.
20; 2:56 a. m.	-2.8	SSW 5	7	9	Few Stcu, Cu, moderate water haze.
20; 1:31 a. m.	-1.1	WxS 5	7-8	9	1 Ci, Acu, moderate water haze.
21; 3:22 a. m.	-8.9	W 4	8-9	8	Few Ci, Cist.
21; 2:04 a. m.	-8.1	WNW 4	8-9	10	1 Ci, Cist.
21; 0:05 a. m.	-6.1	WNW 4	9	10	4 Ciou, 1 Cu, few Acu, no haze.
21; 1:01 p. m.	-4.2	SW 4	8-9	11	1 Ci, 4 Cu, Stcu.
24; 2:29 a. m.	-3.9	W 4	7	10	Few Ci, Cist, moderate haze.
27; 1:41 p. m.	-7.8	WNW 5	8	11	1 Cist, few Acu, few Cu, light haze.
27; 4:24 p. m.	-5.6	NW 5	9	11	4 Steu 5° from sun, light haze.
28; 3:17 p. m.	-3.8	WSW 5	7	8	2 Frcu, Cu, heavy water haze.

POSITIONS AND AREAS OF SUN SPOTS

[Communicated by Capt. J. F. Hellweg, U. S. Navy, Superintendent U. S. Naval Observatory. Data furnished by the U. S. Naval Observatory in cooperation with Harvard and Mount Wilson Observatories. The difference in longitude is measured from the central meridian, positive west. The north latitude is positive. Areas are corrected for foreshortening and are expressed in millions of the sun's visible hemisphere. The total area for each day includes spots and groups]

Date	Eastern standard time	Heliographic			Area		Total area for each day	Observatory
		Diff. in longitude	Longitude	Latitude	Spot	Group		
1935	h m	°	°	°				
Feb. 1	10 59	+51.0	154.5	+30.5	93		93	U. S. Naval.
Feb. 2	11 18	+65.0	155.2	+30.0	93		93	Do.
Feb. 4	12 7	-78.0	345.4	+23.0	31		31	Harvard.
Feb. 5	—	—	No spots					U. S. Naval.
Feb. 6	13 26	-49.5	346.9	+22.5	77			
		+29.0	65.4	-16.5		370	447	
Feb. 7	11 4	-37.5	347.0	+22.5	62			Do.
		+42.5	67.0	-17.0		586	648	
Feb. 8	13 48	-23.0	346.8	+22.5	39			Do.
		+56.5	66.3	-17.5		556	595	
Feb. 9	11 10	-12.0	346.0	+22.0	12			Mt. Wilson.
		+66.0	64.0	-18.0		831	843	
Feb. 10	11 0	0.0	345.0	+22.0	8			Do.
		+74.0	59.0	-18.0		506	514	

Date	Eastern standard time	Heliographic			Area		Total area for each day	Observatory
		Diff. in longitude	Longitude	Latitude	Spot	Group		
Feb. 11	14 15	+16.5	346.6	+22.5	31		31	U. S. Naval.
Feb. 12	13 17	+29.5	346.9	+22.5	31		54	Do.
Feb. 13	13 58	-68.0	235.9	+3.0			123	Do.
		-23.5	280.4	+28.0			15	Harvard.
Feb. 14	10 43	-54.5	238.0	+2.0			128	Do.
Feb. 15	10 45	-43.0	236.3	+1.5			51	Do.
Feb. 16	10 26	-29.5	236.8	+2.0			19	U. S. Naval.
		+12.0	278.3	+28.5			15	Do.
Feb. 17	12 3	+27.0	279.3	+29.0			31	Do.
Feb. 18	11 9	+41.0	280.6	+27.0			15	Do.
Feb. 19	11 4	—	No spots					Do.
Feb. 20	13 11	-62.5	149.8	+30.0	39			Do.
		+16.5	228.6	-26.5			62	Do.
		+65.0	277.1	-14.0			62	163
Feb. 21	11 18	-50.0	150.0	+30.5	46		46	Do.
Feb. 24	12 10	-0.5	159.5	-22.0			108	Do.
Feb. 25	11 12	-75.0	72.4	-18.5			46	Do.
		+14.0	161.4	-22.0			169	Mt. Wilson.
Feb. 26	11 5	-61.0	73.3	-17.0	221			229
		+27.0	161.3	-23.0	8			20
Feb. 27	11 5	-48.0	73.1	-18.5	185			185
Feb. 28	11 1	-34.5	73.5	-18.5	154			164
Mean daily area for 25 days.								194.

PROVISIONAL SUN-SPOT RELATIVE NUMBERS FOR FEBRUARY 1935

(Dependent alone on observations at Zurich and its station at Arosa)
[Data furnished through the courtesy of Prof. W. Brunner, Eidgen. Sternwarte, Zurich, Switzerland]

February 1935	Relative numbers	February 1935	Relative numbers	February 1935	Relative numbers
1	11	21	21	21	21
2	12	Wcd 26	22	22	7?
3	13		18	23	Mc 17
4	14		24	24	a 17
5	15	Me 22	25	25	d
6	29	16	20	26	18?
7	46	17	10	27	20
8	29	18	7	28	20
9	23	19			
10	28?	20	28		

Mean: 21 days = 21.2.

a = Passage of an average-sized group through the central meridian.
c = New formation of a center of activity: E, on the eastern part of the sun's disk; W, on the western part; M, in the central circle zone.
d = Entrance of a large or average-sized center of activity on the east limb.

AEROLOGICAL OBSERVATIONS

[Aerological Division, D. M. LITTLE, in Charge]

By L. T. SAMUELS

Free-air temperatures during February averaged mostly above normal except over Pensacola, Norfolk, and Pearl Harbor (see table 1). The largest departures occurred in the lower levels over Pensacola. Relative humidity departures were mostly positive except over Pensacola and Seattle; the largest departures occurred over Pensacola. Temperature and relative humidity departures are included only for those stations where the length of record is sufficient to obtain a fairly satisfactory normal. The monthly free-air temperatures averaged lowest over the northeastern part of the country and highest over the Gulf coast. The free-air relative humidities

averaged highest over the extreme Northwest, the Ohio Valley, and New England. The region of lowest relative humidity was the Gulf coast.

The free-air resultant winds deviated most from the normal directions over the extreme Northwest, where marked southerly components occurred as compared to the normal westerly. Elsewhere the directions were close to normal (see table 2). Free-air resultant wind velocities were mostly above normal over the southeastern part of the country and generally below normal elsewhere. In most cases the departures from normal were of only moderate magnitude.

TABLE 1.—*Mean free-air temperatures and relative humidities obtained by airplanes during February 1935*

TEMPERATURE (°C.)

Stations	Altitude (meters) m. s. l.																Number of observations		
	Surface		500		1,000		1,500		2,000		2,500		3,000		4,000				
	Mean	Departure from normal	Mean	Departure from normal	Mean	Departure from normal	Mean	Departure from normal	Mean	Departure from normal	Mean	Departure from normal	Mean	Departure from normal	Mean	Departure from normal			
Billings, Mont. ¹ (1,088 m)	-2.2						1.8		0.6		-2.2		-5.0		-11.7		-18.3	27	
Cheyenne, Wyo. ¹ (1,873 m)	-3.7							-1.9		-0.7		-3.7		-10.5		-17.3	28		
Fargo, N. Dak. ¹ (274 m)	-6.7		-5.5		-4.7		-5.0		-6.1		-8.0		-10.5		-16.0		-22.4	28	
Kelly Field (San Antonio), Tex. ² (200 m)	7.7		11.1		11.7		9.7		7.6		4.5		1.6		-4.8		-11.8	24	
Lakehurst, N. J. ³ (39 m)	-4.0		-3.7		-4.6		-5.4		-7.4		-10.1		-12.7		-18.5			16	
Maxwell Field (Montgomery), Ala. ² (52 m)	6.0		7.8		6.6		5.1		2.9		0.7		-1.8		-6.7		-13.6	24	
Mitchel Field (Hempstead, L. I.), N. Y. ³ (29 m)	-2.0		-1.1		-2.3		-2.9		-4.3		-6.2		-8.6		-14.0		-20.4	26	
Murfreesboro, Tenn. ¹ (174 m)	3.3		3.3		2.1		0.9		-0.6		-2.7		-4.9		-10.5		-16.3	27	
Norfolk, Va. ³ (10 m)	1.2	-2.5	2.1	-1.2	1.3	-0.7	-0.2	-0.7	-1.8	-0.7	-3.8	-0.6	-5.6	-0.4	-10.2	-0.2	-15.9	22	
Oklahoma City, Okla. ¹ (391 m)	2.8		3.9		4.6		3.9		2.5		0.0		-2.7		-8.9		-15.9	25	
Omaha, Nebr. ¹ (300 m)	-3.0	+1.4	-1.4	+2.0	-0.5	+1.1	-1.3	0.0	-1.6	+0.8	-3.6	+1.0	-6.2	+1.0	-11.7	+1.4	-18.0	27	
Pearl Harbor, Territory of Hawaii ¹ (6 m)	19.6	-2.7	18.7	-1.0	14.8	-1.0	12.0	-1.3	11.1	-0.2	9.0	-0.6	6.2	-1.4	1.0	-1.4	-4.2	27	
Pensacola, Fla. ⁴ (24 m)	4.7	-5.6	5.9	-4.8	4.6	-4.5	4.2	-3.2	2.2	-3.2	1.0	-2.2	-0.7	-1.6	-5.4	-0.9	-11.8	12	
San Diego, Calif. ³ (10 m)	10.6	-1.9	12.7	+0.5	11.0	+0.3	8.4	0.0	6.0	0.0	3.5	0.0	0.7	-0.2	-5.5	+0.1	-12.6	+0.1	
Scott Field (Belleview, Ill.) ¹ (135 m)	-0.3		1.5		1.5		0.9		-1.1		-3.3		-5.8		-11.4		-16.8	14	
Seattle, Wash. ³ (25 m)	4.3	-2.6	6.3	+0.7	4.9	+2.1	1.5	+1.5	-1.1	+1.6	3.7	+1.7	-6.4	+1.8	-12.3	+0.8		11	
Selfridge Field (Mount Clemens), Mich. ¹ (177 m)	-6.5		-6.2		-7.1		-7.3		-8.3		-10.1		-12.4		-17.2		-23.3	25	
Spokane, Wash. ⁴ (596 m)	-0.6				0.5		0.1		-1.4		-3.5		-6.1		-12.3		-18.7	27	
Sunnyvale, Calif. ³ (10 m)	7.6	-2.8	9.2	-0.7	8.2	0.0	6.4	+0.1	4.5	+0.2	2.5	+0.6	0.2	+0.9	-5.3	+1.7	-10.9	22	
Washington, D. C. ³ (13 m)	-2.3	-3.0	-1.3	-2.2	-1.0	-3.0	-0.5	-4.1	-0.2	-5.9	0.0	-7.5	+0.4	-12.3	+1.0	-17.9	+1.0	22	
Wright Field (Dayton), Ohio ³ (244 m)	-2.6		-3.4		-4.4		-4.7		-5.8		-7.7		-9.5		-14.6		-20.7	22	

RELATIVE HUMIDITY (PERCENT)

Billings, Mont.	63						51		45		42		43		41		43	
Cheyenne, Wyo.	58								56		49		47		46		44	
Fargo, N. Dak.	83		79		70		61		53		50		50		47		43	
Kelly Field (San Antonio), Tex.	84		74		59		52		46		45		44		42		40	
Lakehurst, N. J.	68		63		58		53		48		43		42		38		35	
Maxwell Field (Montgomery), Ala.	78		64		53		44		41		37		38		35			
Mitchel Field (Hempstead, L. I.), N. Y.	78		72		71		67		67		66		64		60		57	
Murfreesboro, Tenn.	79		73		70		66		59		56		54		50		49	
Norfolk, Va.	74	+3	67	+4	64	+6	61	+7	59	+9	57	+9	52	+7	45	+7	40	+6
Oklahoma City, Okla.	74		70		61		53		45		42		43		41		41	
Omaha, Nebr.	87	+6	80	+4	69	+5	63	+6	53	+1	51	-1	55	+3	52	+3	50	+4
Pearl Harbor, Territory of Hawaii.	79	+8	74	+2	78	+2	71	+3	57	-1	50	+4	45	+10	34	+8	37	+8
Pensacola, Fla.	75	-4	62	-6	60	-5	46	-14	37	-18	30	-21	26	-21	23	-22	21	-22
San Diego, Calif.	84	+12	67	+3	57	+1	51	+2	49	+6	47	+8	44	+9	41	+8	40	+8
Scott Field (Belleview, Ill.)	76		63		54		46		41		37		37		33			
Seattle, Wash.	87	+13	70	+2	62	-4	61	-4	57	-6	50	-9	46	-10	43	-13		
Selfridge Field (Mount Clemens), Mich.	78		79		78		68		58		50		48		50		42	
Spokane, Wash.	88		69	+2	64	+2	58	+4	50	+3	45	+3	45	+6	42	+6	41	+6
Sunnyvale, Calif.	86	+9	69	+2	64	+2	58	+4	50	+3	45	+3	45	+6	42	+6	41	+6
Washington, D. C.	76	+4	68	+4	65	+4	59	+2	57	+3	56	+3	51	0	49	-1	44	-1
Wright Field (Dayton), Ohio	79		80		77		70		59		55		54		46		42	

¹ Weather Bureau.² Army.³ Navy.⁴ National Guard.

Observations taken about 5 a. m., 75th meridian time, except along the Pacific coast and Hawaii where they are taken at dawn.

NOTE.—The departures are based on "normals" covering the following total number of observations: Norfolk 107, Omaha 109, Pearl Harbor 93, Pensacola 97, San Diego 123, Seattle 53, Sunnyvale 44, Washington 149.

TABLE 2.—*Free-air resultant winds (meters per second) based on pilot-balloon observations made near 6 a. m. (E. S. T.) during February 1935*

[Wind from N = 360°, E = 90°, etc.]

Altitude (m. s. l.)	Albuquerque, N. Mex. (1,554 m)	Atlanta, Ga. (309 m)	Billings, Mont. (1,088 m)	Boston, Mass. (15 m)	Cheyenne, Wyo. (1,873 m)	Chicago, Ill. (192 m)	Cincinnati, Ohio (153 m)	Detroit, Mich. (204 m)	Fargo, N. Dak. (274 m)	Houston, Tex. (21 m)	Key West, Fla. (11 m)	Medford, Oreg. (410 m)	Murfreesboro, Tenn. (180 m)					
	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	
Surface	340	1.4	309	2.5	254	3.8	275	1.8	287	4.9	300	2.1	288	1.1	287	1.9	289	1.3
500			306	4.3			290	6.6			310	4.3	255	4.1	307	5.1	298	3.5
1,000			304	6.6			294	8.1			314	6.2	271	8.4	302	6.6	318	5.2
1,500			292	7.1	271	8.8	298	9.3			295	9.0	266	10.7	287	7.5	316	10.3
2,000	276	1.7	303	9.4	292	8.2	287	11.1	290	7.0	297	10.3	277	8.4	287	7.5	312	8.4
2,500	282	2.7	301	9.7	294	8.6	284	12.6	303	10.0	299	13.4			319	6.3	229	4.0
3,000	289	2.5			294	8.9	285	15.0	305	10.0					317	14.4	207	4.6
4,000	337	3.1			303	9.4			298	9.6					334	8.2	235	4.3
5,000	2	5.7			241	2.3			260	4.5					328	6.2	265	5.9
															328	7.4		

Altitude (m) m. s. l.	Newark, N. J. (14 m)	Oakland, Calif. (8 m)	Oklahoma City, Okla. (402 m)	Omaha, Nebr. (306 m)	Pearl Har- bor, Terri- tory of Ha- waii ¹ (68 m)	Pensacola, Fla. ¹ (24 m)	St. Louis, Mo. (170 m)	Salt Lake City, Utah (1,294 m)	San Diego, Calif. (15 m)	Sault Ste. Marie, Mich. (198 m)	Seattle, Wash. (14 m)	Spokane, Wash. (603 m)	Washing- ton, D. C. (10 m)		
	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction		
Surface	°	1.7	74	0.9	342	1.5	19	0.7	50	3.8	23	2.8	285	1.5	
500	297	6.6	25	2.9	284	2.0	312	1.7	54	6.6	336	3.2	279	5.3	
1,000	292	7.0	53	1.1	299	5.5	302	7.4	62	5.8	296	6.6	286	9.9	
1,600	271	9.8	26	0.3	320	6.0	308	8.7	81	4.4	285	6.9	291	11.0	
2,000	271	9.8	352	1.4	309	7.0	312	9.2	73	3.6	265	6.6	298	11.8	
2,600	323	3.3	323	8.7	301	10.1	81	2.6	264	8.3	311	13.4	256	2.3	
3,000	313	3.4	324	9.8	317	9.6	70	4.2	284	10.8	313	15.4	276	4.2	
4,000	357	4.3	-----	-----	-----	-----	-----	-----	-----	-----	290	6.0	324	5.5	
5,000	-----	-----	-----	-----	-----	-----	-----	-----	-----	57	2.4	-----	-----	276	5.5

¹ Navy stations.

RIVERS AND FLOODS

[River and Flood Division, MONTROSE W. HAYES, in charge]

By RICHMOND T. ZOCH

The accompanying table shows the places at which flood stages were reached during February. Except for the flood in the Tallahatchie River, which has not subsided and report on which cannot be made in this issue of the REVIEW, these overflows were of minor consequence and caused only slight damage.

The flood in the Allegheny River was the result of an ice gorge. This gorge caused considerable apprehension among the people near the river, but eventually moved out without any damage to property.

Table of flood stages in February 1935

[All dates in February unless otherwise specified]

River and station	Flood stage	Above flood stages—dates		Crest	
		From—	To—	Stage	Date
		Feet	Feet	Feet	Feet
ATLANTIC SLOPE DRAINAGE					
Roanoke: Williamson, N. C.	10	20	23	10.3	21-23
Neuse: Smithfield, N. C.	12	23	28	13.8	28
Cape Fear: Lock No. 2, Elizabethtown, N. C.	20	16	18	21.6	16
Peedee: Mars Bluff Bridge, S. C.	17	19	21	17.4	20
Saluda: Pelzer, S. C.	6	15	17	6.1	16
Chappells, S. C.	13	15	16	14.83	16
Santee: Rimini, S. C.	12	17	23	13.4	19
Ferguson, S. C.	12	18	24	13.1	21, 23
Savannah: Ellenton, S. C.	14	16	21	18.0	18

Table of flood stages in February 1935—Continued

River and station	Flood stage	Above flood stages—dates		Crest	
		From—	To—	Stage	Date
EAST GULF OF MEXICO DRAINAGE					
Cahaba: Centerville, Ala.	23			15	Feet
Tombigbee: Lock No. 3, Ala.	33			21	26.0
Pearl: Pearl River, La.	12	17		22	19
MISSISSIPPI SYSTEM					
Upper Mississippi Basin					
Rock: Moline Bridge, Ill.	10			19	10.9
Skunk: Augusta, Iowa	12	16		19	13.66
Illinois:					
Peru, Ill.	17			16	16
Havana, Ill.	14	26		(1)	20
Beardstown, Ill.	14	27		(1)	19
Ohio Basin					
Allegheny: Parkers Landing, Pa.	18	27		28	20.5
Red Basin					
Sulphur: Ringoe Crossing, Tex.	20	14		14	20.0
Naples, Tex.	22	19		19	22.4
Lower Mississippi Basin					
Big Lake Outlet: Manila, Ark.	10	Jan. 3		(1)	14
St. Francis: St. Francis, Ark.	18	Jan. 21	2	21.7	19
Tallahatchie: Swan Lake, Miss.	26	Jan. 10	(1)	(1)	Jan. 26
Atchafalaya Basin					
Atchafalaya: Atchafalaya, La.	22	1	17	22.8	8-11

¹ Continued into March.